Volume 6, Issue 3 September, 2006

CROP TALK

OMAFRA Field Crop Specialists — Your Crop Info Source

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Will Fusarium be a Problem in the 2006 Spring Wheat Crop?

by Scott Banks, Emerging Crops Specialist, OMAFRA, Kemptville

That's a $1 million question! The month of May had double the normal rainfall in some areas. What's in store for June? Fusarium infection in wheat is very much dependant on the weather that occurs around the time that the wheat heads and begins to pollinate.

In 2006, a lot of spring wheat was planted 1 to 2 weeks earlier than most years, so the spring wheat crop will also be heading earlier than normal. How much earlier will depend on the field's planting date and the temperatures in June. In most parts of the province, spring wheat normally heads during the last week of June or the first week in July. For those fields that were planted earlier this year, start watching for the risk of fusarium infection in mid-June.

Prediction Maps

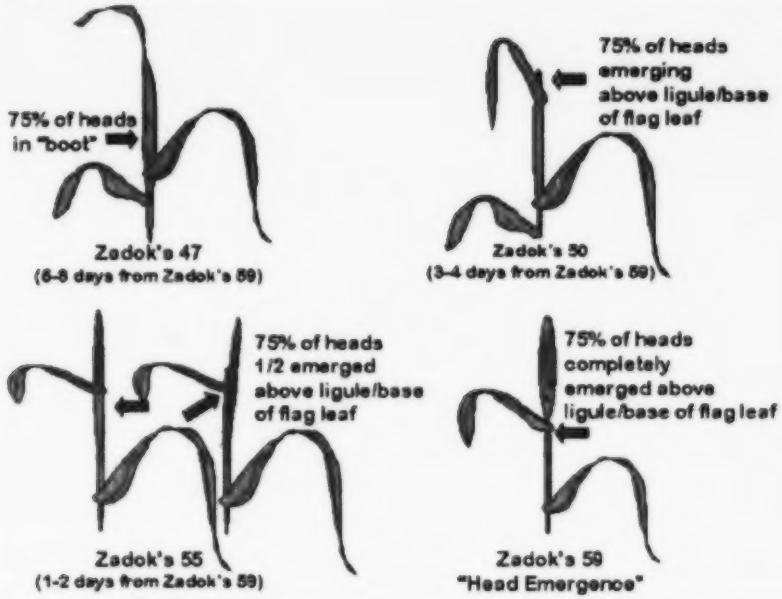
The weather conditions 7 days prior to the wheat heading and for 5 to 10 days after the wheat heads have emerged are critical for fusarium infection. Deoxynivalenol (DON) is the toxin produced by the fusarium mould. DON (in ppm) prediction maps are available at www.ontarioweathernetwork.ca/lib/fusariume.cfm. Site specific DONCAST maps give a more accurate prediction using the field's crop rotation, wheat variety, planting date, soil type, and local weather conditions. The charge is $100 for three fields.

Cropline 1-888-449-0937

Ontario Ministry of Agriculture, Food & Rural Affairs, Crop Technology Branch

Agricultural Information Contact Centre: 1-877-424-1300
Publication Order Centre: 1-888-466-2372
Northern Ontario Regional Office: 1-800-461-6132
OMAFRA Web Site: http://www.omafra.gov.on.ca//english/crops/index.html

Representative Zadok Stages


75% of heads in "boot"
Zadok's 47
(6-8 days from Zadok's 59)
75% of heads emerging above ligule/base of flag leaf
Zadok's 50
(3-4 days from Zadok's 59)
75% of heads 1/2 emerged above ligule/base of flag leaf
Zadok's 55
(1-2 days from Zadok's 59)
75% of heads completely emerged above ligule/base of flag leaf
Zadok's 59
"Head Emergence"

Control

Folicur is currently the only product registered for suppression of fusarium. It is applied from when at least 75% of the wheat heads on the main stem are fully emerged, to when 50% of the heads on the main stem are in flower. On-farm trials have shown an average of about 2 bushels per acre yield increase in spring wheat.

REMEMBER, it is important to monitor the growth stage of the wheat in your own fields to identify the time of head emergence (Zadok's 59) in order to select the proper map for your field listed on the website.

Does Manure Have a Place in the Sulphur Debate?

by Christine Brown, Nutrient Management Field Crop Lead, OMAFRA, Woodstock

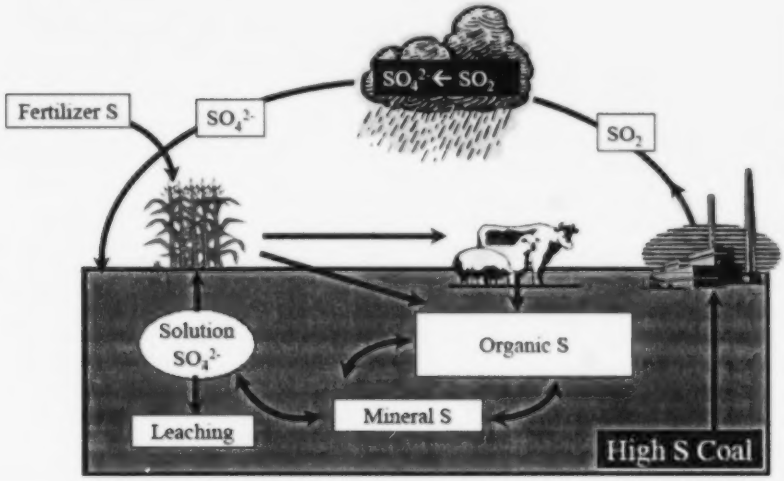
Sulphur is considered a secondary element, along with calcium and magnesium. Sulphur is required in moderate amounts by plants, but is less likely to limit crop growth than nitrogen, phosphorus or potassium. There has been renewed debate about sulphur requirements for crop production in Ontario, due to the reduction of sulphur deposits through acid rain. Where does manure fit into that debate?

Manure and biosolids contain sulphur. The process of sulphur availability is similar to the process of nitrogen availability from manure. Manure contains sulphur in both organic and inorganic forms. A portion of the sulphur in manure will be readily available as sulphate (SO_4^{2}). The other portion that exists as organic sulphur must be converted (mineralized) to sulphate by soil microorganisms before it can be utilized by plants. Most of the sulphur in the soil is in the organic matter.

Sulphur content in manure varies similar to other nutrients, based on livestock type, manure type (liquid vs. solid), bedding type and ration. There is limited analysis data for sulphur in Ontario. Early estimates from a small sample size suggest that in most manure types 25 to 30 percent of the total sulphur is readily available as sulphate. For poultry manures almost all the sulphur is in sulphate form, and early estimates reveal 5 lbs per ton.

Information collected from the USA (American Society of Agronomy Crop Science and Soil Science) and shown in Table 1 estimates the total and available sulphur content from different livestock types.

Sulfur Cycle



Source: Pennsylvania State University

SO_2 = sulphur dioxide
SO_4^{2-} = sulphate

Table 1: **Estimate of Available Sulphur from Manure by Animal and Manure Type**				
Livestock Type	Sulphur Content			
	Solid Manure (lbs/ton)		**Liquid Manure** (lbs/1000 Imp.gal)	
	total	available	total	available
Dairy	1.5	0.8	3.5	1.9
Beef – all types Feedlot[2]	1.7 4.9	0.9	4.0	2.2
Swine – all types Feeder[1]	2.7	1.5	6.3 2.7	3.5
Poultry	3.2	1.8	7.5	4.2

Source: ASA-CSSA-SSSA- Alfalfa production guide

[1] 2001 summary of 92 feeder hog samples (M. Fitzgerald and G. Racz – AgriFood Research & Development Initiative)

[2] 2002 summary of 173 solid beef feedlot samples (B. Olson, Alberta Ag)

There is variation in the amount of sulphur found in manure depending on livestock type, application rate and frequency of application. The debate of sulphur needs for Ontario crops will continue with interest while awaiting side-by-side plot results. However, fields that are manured on a regular basis, with good organic matter levels will not be likely candidates for sulphur deficiency.

Yellow Soybeans - Is It Mn Deficiency???

by Horst Bohner, Soybean Specialist, OMAFRA, Stratford

Yellow leaves with dark veins are the tell tale symptoms of manganese (Mn) deficiency. However, soybeans naturally go through a period when leaves are light-green before the nodules start to supply adequate nitrogen and a dark-green colour returns, so take the time to carefully diagnose the symptoms. Do not confuse this situation with Mn deficiency. If proper nodulation and sufficient nutrients are present soybeans will come out of this yellow phase by early-July.

Symptoms

Symptoms of Mn deficiency are **interveinal chlorosis** (yellowing) on the newest trifoliates, although older trifoliates often show the symptoms as well. Mn is immobile in the plant, so symptoms will generally appear on the younger leaves. Refer to Photo # 1.

Photo #1- Mn Deficiency Interveinal Chlorosis

Simple Test

If it's unclear if Mn deficiency is the problem, take a hand spray bottle (ie:windex type) of Mn in solution, and hand spray 1 metre of row. Flag this section. If Mn is the problem, this section of row will turn dark-green in 2-3 days. If the area does not turn dark-green further analysis is necessary to determine the culprit.

Factors Influencing Mn Deficiency

One of the most significant factors affecting the availability of Mn is the soil pH. As soil pH increases less Mn is available to the plant. That's why Mn deficiency is not generally found in soils with a pH below 6.2. Deficiencies can also appear on eroded knolls where the pH is higher than the rest of the field.

The deficiency is most common on poorly-drained soils, especially clays and silt loams. High organic matter also ties up Mn. Symptoms may occur in hollows where organic matter is higher.

Manganese is less soluble in well-aerated soils. That's why in compacted areas (wheel tracks) a dark-green colour may remain while the rest of the field becomes symptomatic. Refer to Photo #2

Photo #2 - Mn Deficiency In Compacted Wheel Tracks

An over-riding factor is that roots must reach manganese to absorb it. Wet soils, extremely dry soils, cool weather, soil compaction, root diseases, nitrogen deficiency and herbicide damage can limit root growth causing Mn symptoms.

Yield Losses

Correct the deficiency once symptoms are evident. A delay of 2 weeks may decrease yields by 10%. A 6-week delay may result in 30% yield loss. However, yield benefits will only be evident in those parts of the field that actually show symptoms. There is no benefit to spraying a field that shows no symptoms.

Remedy

The general recommendation is to spray the foliage with 2 kg/ha of actual manganese from manganese sulphate (8 kg of manganese sulphate/ha) in 200 L of water. A "spreader-sticker" in the spray is recommended. If the deficiency is severe, a second spray may be beneficial. Chelated sources of Mn are usually applied at lower rates. Check the recommendations for the specific product. Several products are now available. If you have Mn deficiency and would like to be involved in a spray trial please contact me at: horst.bohner@omafra.gov.on.ca

Harvesting The Cereal Nurse Crop As Silage

by Gilles Quesnel, Field Crop IPM Specialist, OMAFRA, Kemptville

There are good arguments for and against the use of a cereal nurse crop when seeding down alfalfa. While the cereal nurse crop provides some early season weed control and additional forage, it also has the potential of providing severe competition to the underseeded alfalfa crop. As well, the stage of maturity of the cereal crop at harvest is critical in determining the yield and quality of the cereal crop when used as forage.

The nurse crop can either be harvested as silage at the late-boot to early-heading stages, or as grain in August with the straw baled. This year, most new alfalfa seedings are well established, but lush cereal growth is likely to provide intense competition to the new seedings. Consequently, if forage feed is needed, removing the nurse crop as silage may be the best option. Removing the cereal competition early in the summer will also allow the alfalfa to establish quickly, giving the opportunity of a second cut by summer's end.

From a feed value stand point, when harvesting the crop as silage, best results are obtained when the cereal crop is harvested early. The ideal time to cut the cereal nurse crop is at the boot (just before heading) to early-heading stage, which usually is about 50 days after planting. It is often tempting to delay the harvest of the nurse crop given that dry matter yield of the cereal increases by about 50% from the boot stage to the milk stage. But, research at New Liskeard campus, University of Guelph demonstrated that as cereal maturity progresses from the boot stage to the milk stage, the in-vitro digestibility of the crop drops from approximately 80% to 60%, crude protein drops from above 17% to 10%, while ADF increases by about 20%. Once the cereal crop reaches the milk stage and beyond, it becomes high in fibre and low in digestibility, dropping significantly in feed value. Additionally, a cereal nurse crop at the late-milk stage or dough stage is difficult to ensile since the moisture content of the plant drops too low for proper fermentation.

As for harvest management, cereal grains mature rapidly around the heading stage. As such, harvest of a cereal nurse crop as silage should begin slightly ahead of the harvest maturity stage desired.

Weather Weenies We Are!

by Ian McDonald, Applied Research Coordinator, OMAFRA, Guelph

Canadians love to talk about the weather, especially those of us in agriculture. It controls our lives more than any other sector of the economy. You can cut a tree, be a tourist, build a widget, or shop in any weather, but not so in farming. Since our lives are so dependent on the weather, let's look at some practical aspects of finding the weather information we need.

High-Speed Access More Available

The graphical nature of websites often makes dial up too slow and almost impossible to use for "web surfing" without access to high-speed internet. I am encouraged that high-speed access is becoming more available in the rural areas and at a more reasonable cost. If you have been discouraged in the past by lack of access to high-speed in your area, it might be time to revisit this, as a lot has changed in the last year.

My Favourite Weather Sites

Weather information is everywhere, but where is the stuff we really need. We are interested in forecasts, weather warnings, satellite/radar imagery, and often historical data (ie how much rainfall did we get last week).

Most internet sources of Ontario weather utilize information from Environment Canada (weatheroffice.ec.gc.ca/canada_e.html), which also makes various weather products available to the general public. I use these sites, but prefer other resources and others to find the information I am interested in. Other resources are better for radar/satellite imagery.

Farmzone.com

One of the best sources of weather data for Canadian agriculture is available through the Weather Network (www.theweathernetwork.com). They have a site called **Farmzone.Com** (www.farmzone.com) that provides excellent information for us.

Lets work our way through this site to see what it can provide us with, weather wise. From the home page at www.farmzone.com, click on "Southern Ontario" (Figure 1). Then at the next screen click on the specific area you are interested in - example London (Figure 2).

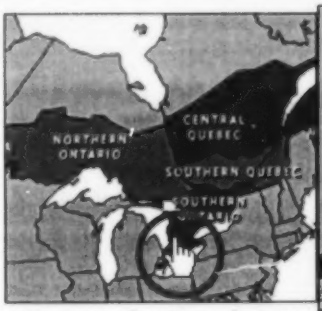


Figure 1 - Southern Ontario

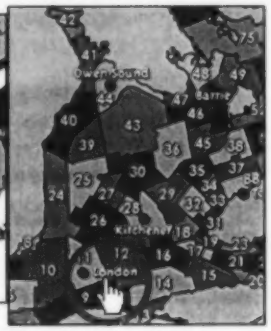
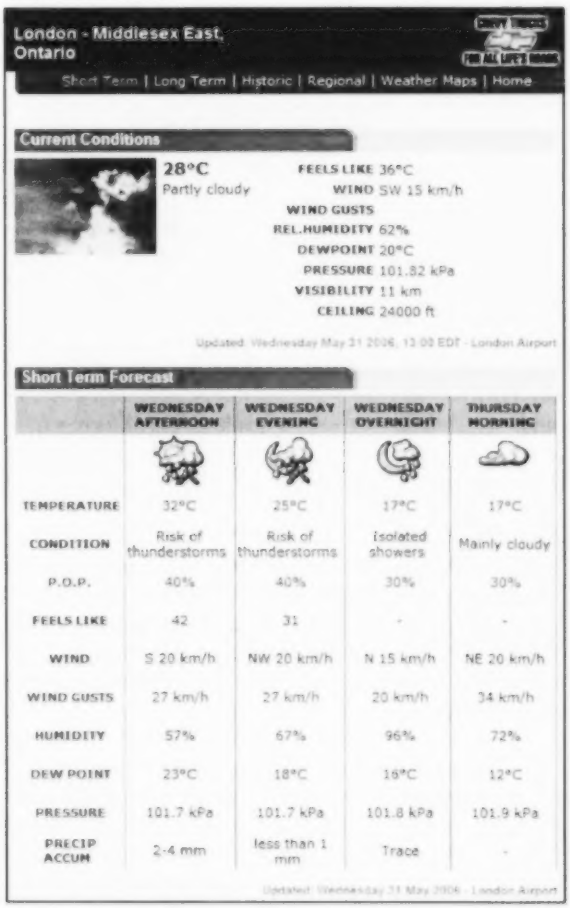


Figure 2 - London

You are then presented with the local forecast and can select from various options as detailed in Figure 3 (note the cursor arrow). This screen also shows you the "Planning Forecast For Tomorrow" information highlighted in Figure 4. You can also access the "Long Term Forecast" (Figure 5), "Historical Data" (Figure 6), "Regional" and "Weather Map" resources.



London - Middlesex East, Ontario

Short Term | Long Term | Historic | Regional | Weather Maps | Home

Current Conditions

28°C
Partly cloudy

FEELS LIKE 36°C
WIND SW 15 km/h
WIND GUSTS
REL.HUMIDITY 62%
DEWPOINT 20°C
PRESSURE 101.82 kPa
VISIBILITY 11 km
CEILING 24000 ft

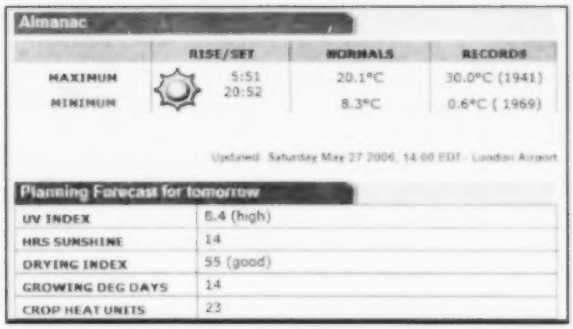
Updated: Wednesday May 31 2006, 13:00 EDT - London Airport

Short Term Forecast

	WEDNESDAY AFTERNOON	WEDNESDAY EVENING	WEDNESDAY OVERNIGHT	THURSDAY MORNING
TEMPERATURE	32°C	25°C	17°C	17°C
CONDITION	Risk of thunderstorms	Risk of thunderstorms	Isolated showers	Mainly cloudy
P.O.P.	40%	40%	30%	30%
FEELS LIKE	42	31	-	-
WIND	S 20 km/h	NW 20 km/h	N 15 km/h	NE 20 km/h
WIND GUSTS	27 km/h	27 km/h	20 km/h	34 km/h
HUMIDITY	57%	67%	96%	72%
DEW POINT	23°C	18°C	16°C	12°C
PRESSURE	101.7 kPa	101.7 kPa	101.8 kPa	101.9 kPa
PRECIP ACCUM	2-4 mm	less than 1 mm	Trace	-

Updated: Wednesday 31 May 2006 - London Airport

Figure 3 - Local Forecast & Current Conditions



Almanac

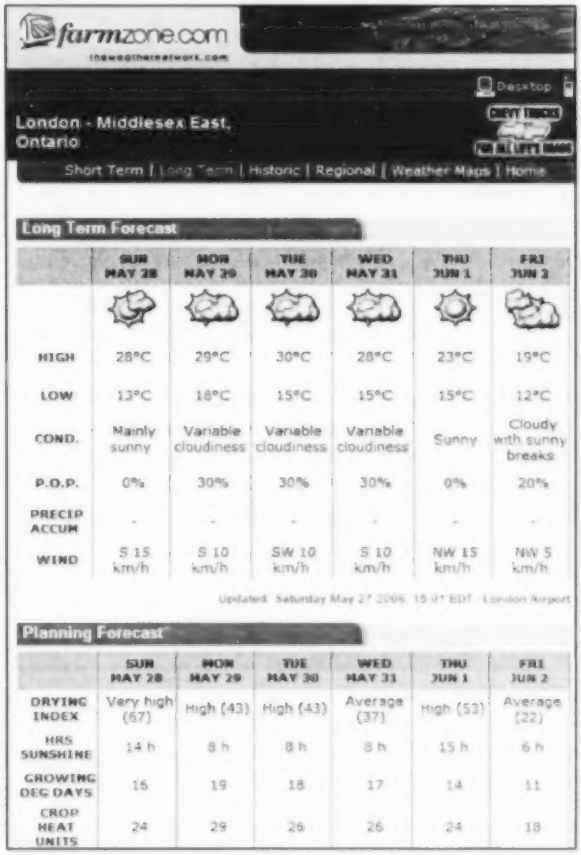
	RISE/SET	NORMALS	RECORDS
MAXIMUM	5:51	20.1°C	30.0°C (1941)
MINIMUM	20:52	8.3°C	0.6°C (1969)

Updated: Saturday May 27 2006, 14:00 EDT - London Airport

Planning Forecast for tomorrow

UV INDEX	8.4 (high)
HRS SUNSHINE	14
DRYING INDEX	55 (good)
GROWING DEG DAYS	14
CROP HEAT UNITS	23

Figure 4 - Almanac & Planning Forecast For Tomorrow



farmzone.com

Desktop

London - Middlesex East, Ontario

Short Term | Long Term | Historic | Regional | Weather Maps | Home

Long Term Forecast

	SUN MAY 28	MON MAY 29	TUE MAY 30	WED MAY 31	THU JUN 1	FRI JUN 2
HIGH	28°C	29°C	30°C	28°C	23°C	19°C
LOW	13°C	18°C	15°C	15°C	15°C	12°C
COND.	Mainly sunny	Variable cloudiness	Variable cloudiness	Variable cloudiness	Sunny	Cloudy with sunny breaks
P.O.P.	0%	30%	30%	30%	0%	20%
PRECIP ACCUM	-	-	-	-	-	-
WIND	S 15 km/h	S 10 km/h	SW 10 km/h	S 10 km/h	NW 15 km/h	NW 5 km/h

Updated: Saturday May 27 2006, 15:01 EDT - London Airport

Planning Forecast

	SUN MAY 28	MON MAY 29	TUE MAY 30	WED MAY 31	THU JUN 1	FRI JUN 2
DRYING INDEX	Very high (67)	High (43)	High (43)	Average (37)	High (53)	Average (22)
HRS SUNSHINE	14 h	8 h	8 h	8 h	15 h	6 h
GROWING DEG DAYS	16	19	18	17	14	11
CROP HEAT UNITS	24	29	26	26	24	18

Figure 5 - Long Term Weather Forecast

From the "Historical Data" (Figure 6) which you access via the "Historic" selection beside the "Long Term" forecast, you can find information for any specific day in the past (note #1), or the precipitation and heat recorded over a number of days (note #2). One caution is that there is no warning if daily information is missing from the period within the range you have chosen. I have spoken to Farmzone and they are hoping to rectify this problem by fall.

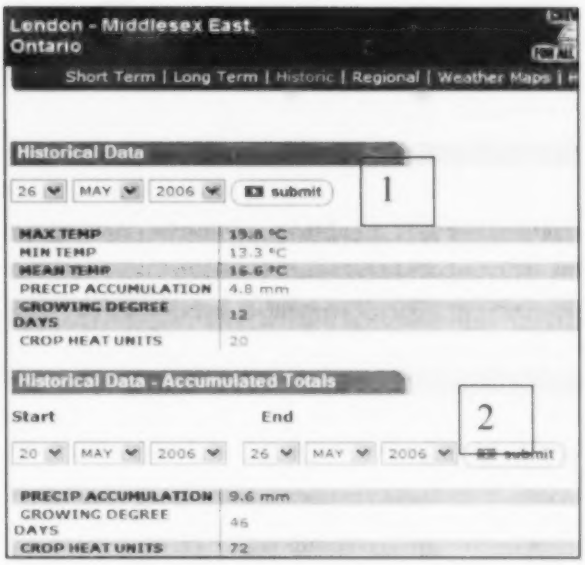


Figure 6 - Historical Data

Radar & Satellite Images

Radar and Satellite images enables us to see what weather is coming our way. I prefer to use **The Weather Channel** (www.theweatherchannel.com) or **Intellicast** (www.intellicast.com) images.

A brief list of urls is included. The best option is to go to the respective home page, type in a US location close to you, and then select the radar or satellite images. Using Port Huron MI, Erie PA, Niagara Falls NY or Watertown NY gets almost full coverage of Ontario. These sites give a clear view of where the rainfall and cloud cover is and are very useful in determining for instance, if you can get that last 20 acres planted before it rains.

Remember, you can add any of these weather pages to your "favourites" listing in your web browser allowing you to go directly to these pages at any time.

Pasture Growth and Quality

by Jack Kyle, Grazier Specialist, OMAFRA

Forage growth and quality goes through a transition during the growth cycle. At the beginning of the growth cycle, the forage quality is high but the yield is very low. As the plant matures there is a significant increase in the forage yield but an accompanying decline in forage quality. The pasture manager's goal is to have livestock consume the forage at the point where there is optimum yield of quality forage to produce the best livestock performance.

Early Growth

During the early growth phase (1-2 leaves), forage quality will be over 20% protein. This is higher than livestock requirements and the extra protein will be lost in the urine. Even 16% protein levels can adequately promote optimum livestock production. In this early growth stage, the photosynthesis level is low and much of the growth is produced from root reserves.

Optimum

The ideal harvest time for pasture grasses is after the third leaf has emerged and before the seed head emerges. Pasturing at this stage will give the optimum yield of forage that is of sufficient quality to support optimum growth of the pasturing livestock. For domestic cool season grasses this will represent a forage height of 10-14 inches.

Coupled with this optimum quality and yield stage are several other factors that will contribute to optimum growth. Plant root systems tend to be a mirror image of the top growth. The more height and density to the visible forage, the greater the root mass and the deeper the roots will penetrate the soil. This larger root system will enable the plant roots to find water as dry conditions develop and continue to grow and thrive as the soil surface becomes dry. The deeper roots have the advantage of growing in cooler soil. Cool season plants will start to go dormant if soil temperatures

http //www.weather.com/maps/maptype/satelliteusnational/northeastussatellite_large.html	this one is for satellite of northeastern NA
http //www.weather.com/maps/maptype/dopplerradarusnational/northeastradar2100mile_large.html	north east radar at 2100 miles
http //www.weather.com/weather/map/USMI0684?name=index_large&day=1	local radar at Port Huron, MI
http //www.weather.com/weather/map/USNY1010?name=index_large&day=1	local radar at Erie, PA

rise too high. If the top growth is kept short, roots are shallow, and this will result in slower growth with no drought and heat tolerance. If there is no plant residue and very limited top growth there will be bare soil exposed that will be prone to over-heating and evaporation This also results in reduced plant growth and early onset of drought conditions.

High Yield & Low Quality
At the other end of the scale is the high yield and low quality scenario that happens once the seed heads emerge and mature. At maturity, the yield of dry matter is high but the feed quality has dropped significantly and will not provide the protein and energy to meet the needs of the livestock. At this stage much of the energy from photosynthesis is being directed to seed development rather than vegetative growth. Growth is slowed with very little accumulation of energy in the plant tissue.

For optimum plant growth and productivity it is important to harvest pasture forage at the 10-12 inch height and before any seed heads emerge. A forage residue of 3-4 inches should be left to support the root system and provide the photosynthesis for re-growth. If you follow these grazing guidelines you will optimize the forage quantity and quality that is produced in your pastures, as well as the livestock production.

Wide Swath Haylage

by Joel Bagg, Forage Specialist, OMAFRA, Lindsay

Wide swath haylage to achieve **"haylage-in-a-day"** and improve forage quality is a management practice we are hearing more about. This is contrary to the more typical practice of using the mower-conditioner to place the swath in a narrow windrow for a day or two of wilting, and then chop directly. Wide swath haylage requires some innovation and significant changes in both equipment and management, but research indicates that improvements in forage quality can be quite impressive.

Respiration Losses
Rapid wilting after cutting is critical to minimize the often significant respiration losses of sugars in high quality haylage. This is especially true for higher yielding first-cuts. Plant respiration continues after cutting until about 60 - 65% dry matter, when the cells are actually dead. Respiration converts stored carbohydrates (starch and sugar) to carbon dioxide, heat and moisture, and causes dry matter losses and increased fibre percent. Forage that is higher in the soluble carbohydrates will have **greater digestible energy**, but also can provide more readily fermentable substrate to lactic acid bacteria resulting in **better haylage fermentation**. The longer the wilting period in the field, the greater the respiration losses (less sugars), and the lower the forage quality.

Wide Swaths
Wider swaths dry faster, so adjusting the mower to leave as wide a swath as possible makes sense. Research by Tom Kilcer, Cornell University Extension, indicates that wide swath width (85% of cutter-bar width) and sunlight (cutting in the morning) are the keys to fast wilting for haylage high in digestible energy and improved fermentation. Freshly cut forage doesn't know it's dead yet. Carbohydrates gained from photosynthesis in a wide swath exposed to sunlight typically exceeded the respiration losses. The Cornell research indicates that wide swaths can significantly improve forage quality, consistency and "milk-per-ton" of haylage. Milk per ton was improved by 300 lbs. As a bonus, haylage-in-a-day also reduces the risk of rain-damage!

Impact of Conditioning & Sunlight on Wilting
Swath width is typically limited by the width of the conditioner on the mower. So if I have to forego conditioning to widen the swath, doesn't that negate any advantage of having a wide swath? According to the Cornell research, conditioning actually reduced wilting speed in wide swaths at haylage moisture levels by disrupting the capillary flow and evapotranspiration of moisture through the stems to the stomata (pores) in the leaves.

In a narrow dense windrow, the stomata close, so conditioning is an important drying mechanism. On the other hand, if you have a wide swath and sunlight to keep the stomata open, you can forego conditioning in a haylage system. With wide swaths, conditioning would not become a requirement until the stomata close when moistures fall below 60-65% when making dry hay.

Conditioning stems is extremely important at lower moistures in making dry hay. Strategies for wilting silage are quite different than dry hay making, but wide swaths are advantageous for both.

Stomata are generally open during the day and closed at night (or on the bottom of a tight swath). A wide swath maximizes exposure to sunlight, which keeps the stomata open and maximizes exposure to solar radiation (heat and lower humidity). Contrary to some western research, in Ontario conditions with high humidity and warm nights, respiration losses during the night exceed the extra sugars expected by cutting late in the day.

Equipment Changes & Modifications

Of course, wide swaths will likely require that the swaths be moved and narrowed for chopping. This is an obstacle preventing many from making wide swath haylage. Some are adopting the use of **windrow mergers** that use a pickup and belt (similar to an inverter, but wider) rather than rakes, in order to reduce the risk of rocks, clostridia and ash. A rock in the chopper is a huge problem to be avoided. Combining two or more windrows into one with a merger creates the need for an extra field operation, but it also increases chopper capacity and speed. Moving an "almost ready" swath with a merger also speeds wilting. A merger is cheaper and faster to run than a harvester.

There is some concern about driving on a wide swath. The Cornell research indicates that in a wide swath situation, driving on the cut swath with the tractor is not an issue that significantly affects drying. However, there may be some potential for soil contamination that adversely affects fermentation, particularly in wet field conditions. Tractor tires can be set as wide as possible.

Before purchasing wide swath haylage equipment, it is important to consider the compatibility of the:

- mower (or mower-conditioner) swath width,
- merger pick-up width, and the
- forage harvester pick-up width.

For many of us, swath width is currently limited by the width of the conditioner on the mower. If a narrow swath mower can be modified to lay a wide swath without conditioning, this could improve wilting speed. Most mower-conditioners have an easy swath width adjustment. Ron Schuler (Extension Engineer, University of Wisconsin) reports that the average **maximum** swath width on the North American market is 61.4% of the cut width, with a range of 28 to 87%. Self-propelled widths are usually narrower. Swath width percentage should be a consideration when purchasing a new mower. The wider the better!

Bottom Line

Bottom line for wide swath haylage - cut as wide as possible and cut in the morning. The full adoption of wide swath haylage will require some machinery innovation and modification on the part of forage equipment companies and farmers. In the mean time, open your mower as wide as practical.

Can Foliar Fungicides Bump Edible Bean Yields & Quality?

by Brian Hall, Edible Bean & Canola Specialist,, OMAFRA, Stratford

Dry bean growers are familiar with the use of fungicides to protect against white mould and anthracnose. Both diseases can have devastating impacts on yield and quality of dry beans. During the past 3 seasons, white bean growers have experienced localized outbreaks of anthracnose that have reduced yield and increased dockage and pick. Growers and researchers are now looking to test if using a foliar fungicide can boost dry bean and soybean yields, even in the absence of disease.

Part of the interest in foliar fungicides stems from the static yields of dry beans (and soybeans). With the exception of the past two seasons of record dry bean yields, the provincial yield has remained relatively static around 14 – 15 cwt/acre. While genetic improvements in dry beans continue to be made, growers have struggled with consistently realizing these improvements. The industry is now looking at how more intensive management can 'tweak' plants to yield more through improved 'plant health'.

Research

There has been some research that shows the use of a fungicide in the absence of disease results in visibly longer retention of green leaves and measurable improvements in yields. BASF and Syngenta Crop Protection report in some company

and grower trials, improved plant health late in the season, and a boost in yields. The Strobilurin fungicides, such as Headline (BASF) and Quadris (Syngenta), are of particular interest because of the suggestion that not only do they work very effectively against targeted diseases, but they also influence the plants physiology. These effects can include reducing the production of ethylene in plants late in the season, and therefore delaying leaf drop and plant senescence, improving carbon assimilation, improving plant growth efficiency and increasing tolerance to stress during flowering and pod fill.

However, the data that supports a payback to growers is not always clear-cut. One piece of soybean research that is capturing media attention is a report by Marty Draper, Plant Pathologist at South Dakota State University. Draper summarized foliar fungicide trials on soybeans across 65 locations in the north-central Midwest in 2005. Some of the trials had some level of secondary foliar disease, while others did not. In about one-third of the trials, application of a strobilurin fungicide yielded at least an additional 4 bu/ac, one-third showed 0 – 4 bu/ac more, while one-third showed a yield loss compared to an untreated check. In two-thirds of the trials, the grower would not have made any additional money after the cost of the treatment.

Edible Bean Trials

In edible beans, the research into the benefit of a late-season application of a strobiluron is just getting started. Chris Gillard, RCAT (U of Guelph) is researching the impact these products have on plant health and yield of white beans, cranberry, and kidney beans. The Ontario Coloured and White Bean producer groups are working with BASF and Syngenta on a research and field trial project to evaluate the plant health and yield response to Headline and Quadris. Growers are encouraged to conduct their own trials, and include at least 2 unsprayed (check) strips in a field. This will allow evaluation of both a visual level of plant health and yield measurement. It is important to time application of the fungicides correctly. For example, the suggested application timing for the trial of Quadris is at one open bloom, so it is important to stage the crop correctly. Growers should contact the product representative for information. Growers may obtain a plot outline by contacting Brian Hall, OMAFRA (519 271-0083 or brian.hall@omafra.gov.on.ca). Chris Gillard, RCAT will also be conducting small plot research in conjunction with the on-farm trials.

IPM Strategy Still The Only Game In Town

For dry bean growers, the best management strategy for now is to remember that the primary function of fungicides is to control specific diseases. Controlling diseases is best accomplished by an integrated approach that includes crop rotation, sanitation, scouting, and using weather and disease forecast models. Broad-spectrum fungicide application without targeting specific diseases may promote earlier disease resistance to a fungicide. These products are very specific in the diseases they control and timing is critical. Last year, some growers applied a strobilurin for control of bacterial blight, for which these products do not work. A heavy late-season outbreak of Common Blight was widespread in some areas. This resulted in earlier plant maturity, and increased dockage and pick at the elevator, for which the grower could do nothing. The best management strategy for blight at present is to use blight-free seed. Genetics holds promise, with the release of OAC REX, the first white bean variety resistant to blight.

Planning a Crop Rotation

by Hugh Martin, Organic Crop Production Program Lead, OMAFRA, Guelph

Now that summer is starting and the crops are well established, have you started thinking about next year? Do you have a planned rotation for each field? Does this include cover crops whenever possible? Organic farmers know that a good crop rotation is the basis of a good cropping system to allow them to maintain good pest control.

Disease

Good crop rotations help to develop healthy soils and are better able to suppress pests and improve the health of the crops. For example, there are approximately 50 diseases of beans (Phaseolis spp.). Crop rotation helps to eliminate about 33 of them, including bacteria and nematodes and nearly all fungi diseases. One of ways this works is that plant pathogen propagules have a lifetime in the soil, and a crop rotation that excludes host crops starves them out.

Diverse crop rotations lead to more diversity in the soil. Cover and rotation crops shift the composition of the non-pathogenic microbial community to be more suppressive to diseases. Many studies have shown Brassica cover crops to suppress diseases. It is felt that the glucosinolates, which break down to isothiocyanates, contribute to this, but there are also other compounds involved as well. Oat cover crops have also been shown to suppress root rot in peas.

Insects

Similarly, insects are suppressed by good rotations. When we grew a lot of continuous corn 25 years ago, even second-year corn needed a corn rootworm insecticide. During the past decade our use of corn rootworm control has declined to a fraction of usage in the 1980's due to the fact that we now rarely grow corn-after-corn.

Weeds

Crops can be planted in either spring or fall, which alters their abilities to compete with weeds. Related tillage activities can also kill germinating weed flushes in spring or fall. Cereals crops are planted in narrower rows which help them canopy and out-compete weeds. Forages crops are cut several times each summer which is an excellent way to suppress many perennial weeds.

Spread The Workload

A good crop rotation also spreads out the workload, which is a labour saving in the overall operation of the farm. Improving your crop rotation may also let you increase the size of your farm within your existing resources of labour and equipment.

Having a good crop rotation will make you money, both by increasing yield and by decreasing costs. Crop rotation takes planning to make sure it meets the needs of the farm and the flexibility to allow you to take advantage of market changes.

Action: Plan your cover crops and crop rotation for 2007 and 2008 now!